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Spring 2007

CS 801: Advanced Database Systems

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CS 801 Advanced Database Systems

Spring Quarter, 2007

Description : Introduction of current trends and research issues in database systems.

Prerequisite : CS701 or an equivalent.

Instructor : Dr. Soon M. Chung

403 Russ, 775-5119

schung@cs.wright.edu, <http://www.cs.wright.edu/~schung>

Class : Tu. Th. 6:05-7:20 pm, 028 Millet Hall

Office hour : Tu. Th. 2:30-3:30 pm at 403 Russ or by appointment.

*use e-mail for short questions.

Course Material: Technical papers on the following topics:

Object-Oriented Database

Query Processing in Distributed Databases

Replica Control in Distributed Databases

Parallel Query Processing and Optimization

Data Mining

Spatial Databases

Heterogeneous Multidatabases

Multimedia Databases

Logic and Databases

Data Warehouse

Reference Book : R. Elmasri and S. B. Navathe, Fundamentals of Database Systems, Addison Wesley Co., 2006.

Grading : A:[85,100], B:[75,85), C:[65,75), D:[55,65), F:[0,55)

Midterm 30% (5/8 Tu), Final 40% (6/7 Th, 8:00-10:00 pm) and Project 30%

Project is either writing a research proposal or design and implementation (select by 5/10)

Research proposal 30%

{ papers reviewed 6%, technical quality 8%,
written presentation 7%, originality 9% }

Design project 30%

{ design 8%, implementation and/or analysis 8%,
written presentation 6%, discussion 8% }

CS 801 Database Development Project

1. Design and implementation of a database or a database processing algorithm.
2. Possible topics are:
 - Object-Oriented database design and implementation, and then execute object-SQL queries or transactions on the database.
 - Design and implement a Web interface to your database (designed previously in CS605 or CS701). For example, Java applets can be implemented to accept user input, invoke queries/transactions on the DB, and return the result to the user.
 - Implement an algorithm and report the performance result. For example, a data mining algorithm or a parallel join algorithm can be implemented and executed on sample data.
3. Submit a description of your topic and a list of reference papers/documents. (due 5/10)
4. Detail description of design, implementation, result, and discussion must be included in the report.
5. Size of the final report is between 20 and 35 double-spaced pages. (due 6/7)

Technical Reference Sources

- IEEE Trans. on Software Engineering
- IEEE Trans. on Knowledge and Data Engineering
- Computer (IEEE Computer Magazine)
- Communications of ACM
- ACM Trans. on Database Systems
- ACM Trans. on Information Systems
- Information Systems (Journal)
- Data and Knowledge Engineering (Journal)
- Data Mining and Knowledge Discovery (Journal)
- IEEE Tutorials, such as Tutorial on Database Systems, etc.
- Proc. of IEEE Int'l Conf. on Data Engineering
- Proc. of ACM Conf. on Management of Data (SIGMOD Conference):
refer to the volumes of SIGMOD RECORD
- Proc. of ACM SIGKDD Int'l Conf. on Knowledge Discovery and Data Mining
- Proc. of Int'l Conf. on Very Large Data Bases (VLDB)
- Knowledge and Information Systems (Journal)
- IEEE Trans. on Parallel and Distributed Systems
- ACM Computing Surveys
- ACM/Springer-Verlag Multimedia Systems
- IEEE Multimedia
- and Others

CS 801 Research Proposal Writing Project

1. Write a research proposal for design/implementation and/or performance analysis (based on deterministic modeling, analytical modeling, or simulation).
2. Submit a description of your topic and a list of reference papers. (due 5/10)
3. Description of a research topic, background and problem statement, existing solutions, your solution idea and/or approach with some justification, plans for design/implementation/performance analysis, expected outcome, etc. can be included in the proposal.
4. Size of the final report is between 20 and 35 double-spaced pages. (due 6/7)

Possible Topics

- Database models
- Database access mechanism (such as indexing, hashing, etc)
- Query optimization
- Concurrency control and recovery
- Parallel algorithms for query processing
- Performance evaluation of DBMS
- Distributed database
- Heterogeneous databases (Multidatabases)
- Expert database
- Logic and database
- Multimedia database (e.g. Image/video database)
- Object-Oriented database
- Engineering database
- CAD/CAM database
- Data mining
- Data warehouse
- Other relevant topics

Reference Sources

- IEEE Trans. on Software Engineering
- IEEE Trans. on Knowledge and Data Engineering
- Computer (IEEE Computer Magazine)
- Communications of ACM
- ACM Trans. on Database Systems
- ACM Trans. on Information Systems
- Information Systems (Journal)
- Data and Knowledge Engineering (Journal)
- Data Mining and Knowledge Discovery (Journal)
- IEEE Tutorials, such as Tutorial on Database Systems, etc.
- Proc. of IEEE Int'l Conf. on Data Engineering
- Proc. of ACM Conf. on Management of Data (SIGMOD Conference)
refer to the volumes of SIGMOD RECORD
- Proc. of ACM Symp. on Principles of Database Systems (PODS)
- Proc. of Very Large Data Bases (VLDB)
- Proc. of Int'l Conf. on Knowledge Discovery and Data Mining
- Knowledge and Information Systems (Journal)
- IEEE Trans. on Parallel and Distributed Systems
- ACM Computing Surveys
- ACM/Springer-Verlag Multimedia Systems
- IEEE Multimedia